STATEMENT OF WORK FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY RICHARDSON FLAT TAILINGS SITE LOWER SILVER CREEK, OPERABLE UNIT 2

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1. INTRODUCTION

The purpose of this remedial investigation/feasibility study (RI/FS) for Lower Silver Creek (the Site), is to investigate the nature and extent of contamination at the Site and develop and evaluate potential remedial alternatives. The RI and FS are interactive and may be conducted concurrently so that the data collected in the RI influences the development of the remedial alternatives in the FS, which in turn affects the data needs and the scope of any treatability studies.

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United Park City Mines (UPCM) will conduct this RI/FS and will produce a draft RI and FS report that are in accordance with this Statement of Work, the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (U.S. EPA, Office of Emergency and Remedial Response, October 1988) and any other guidances that EPA uses in conducting a RI/FS (a list of the primary guidances is attached), as well as any additional requirements in the Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study (Settlement Agreement). The RI/FS Guidance describes the report format and the required report content. Respondent will furnish all necessary personnel, materials and services needed, or incidental to, performing the RI/FS, except as otherwise specified in the Settlement Agreement.

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At the completion of the RI/FS, EPA will be responsible for the selection of a Site remedy and will document this selection in a Record of Decision (ROD). The remedial action alternative selected by EPA will meet the cleanup standards specified in CERCLA Section 121. That is, the selected remedial action will be protective of human health and the environment, will be in compliance with, or include a waiver of, applicable or relevant and appropriate requirements of other laws, will be cost-effective, will utilize permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable, and will address the statutory preference for treatment as a principal element. The final RI/FS report, as adopted by EPA, and the Human Health and Ecological Risk Assessment will, with the administrative record, form the basis for the selection of the Site's remedy and will provide the information necessary to support the development of the ROD.

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As specified in CERCLA Section 104(a)(1), as amended by SARA, EPA will provide oversight of the Respondent's activities throughout the RI/FS. Respondent will support EPA's initiation and conduct of activities related to the implementation of oversight activities.

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2. PURPOSE OF THE STATEMENT OF WORK

This Statement of Work (SOW) sets forth requirements for conducting an RI/FS at the Site. Respondent will develop all Sampling and Analysis Plans (SAPs), perform all sample collection and analysis in accordance with established EPA protocol, perform all data validation, and produce a draft RI and FS report for the Site. Respondent will provide copies of all documents to EPA for review, as provided in the Settlement Agreement. EPA shall provide written comments on these draft documents to Respondent within 30 days of document receipt. Respondent will take these comments into consideration when finalizing the document. Any comments that Respondent does not accept will be discussed with EPA prior to release of the next version of the document.

As specified in CERCLA Section 104(a)(1), EPA will provide oversight of Respondent's activities throughout the RI/FS. Respondent shall support EPA's initiation and conduct of oversight activities. EPA's determinations, approvals, and activities as provided for in the Settlement Agreement and in this SOW shall be conducted in consultation with the State as provided for by CERCLA, the National Contingency Plan, and applicable guidance.

Performance of the Work described in this SOW by Respondent and EPA's review and approval of documents and activities described in this SOW shall be performed in accordance with the procedures described in the Settlement Agreement. Respondent shall furnish all necessary personnel, materials, and services needed or incidental to performing the Work described in this SOW, except as otherwise specified in the Settlement Agreement.

3. TASK 1 – SCOPING

The Site objectives for the Lower Silver Creek Site located in the State of Utah have been determined preliminarily, based on the available information, to be the following:

Protection of human health and the environment through a strategy of excavation or isolation of tailings to prevent tailings from becoming wind-borne, or contributing to contaminant leaching into Silver Creek.

3.1 Site Background

Before planning RI/FS activities, all existing Site data will be thoroughly compiled and reviewed by Respondent. Respondent will refer to Table 2-1, of the RI/FS Guidance for a comprehensive list of data collection information sources. This information will be utilized in determining additional data needed to characterize the Site, better define potential applicable or relevant and appropriate requirements (ARARs), and develop a range of preliminary identified remedial alternatives. Data Quality Objectives (DQOs) will be established, subject to EPA approval, which will specify the usefulness of existing data. Decisions on the

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necessary data and DQOs will be made by EPA. Respondent shall assemble existing information relevant to the RI/FS for the Site including but not limited to:

- All documentation and reporting of historical operations activities and studies concerning the contaminants associated therewith,
- All environmental sampling and analysis plans,
- All environmental and other data, maps and photos, and
- All reports describing data summaries, data evaluations, or interpretations of data.

This shall include available data relating to the types and quantities of hazardous substances, pollutants, or contaminants within the Site and past material management and disposal practices.

Respondent shall provide this information to EPA and the State in accordance with the schedule contained in Section 11 of this SOW. This data will be assembled in the RI for the Site.

3.2 Conduct Field Visit

Respondent shall conduct a field visit of the Site during the project scoping phase to assist in developing a sampling approach to fully characterize the nature and extent of contamination within the Site. Respondent shall invite EPA and the State to participate in the field visit and shall provide at least two weeks notice of the proposed date.

3.3 Project Scoping Summary – Plan Development

Based on review of the existing information and the field visit, the specific project scope will be planned. Project planning activities include those tasks described below as well as identifying data needs, developing a Workplan, designing a sampling plan and identifying health and safety protocols to collect information required to complete an RI/FS for the Site. The RI/FS Workplan and sampling and analysis plan must be reviewed and approved by EPA prior to initiation of field activities. Respondent will meet with EPA regarding the following activities and before the drafting of the scoping deliverables:

- Refine and document preliminary remedial action objectives and alternatives

Once existing Site data has been analyzed and an understanding of the potential Site risks has been determined by EPA, Respondent will review and, if necessary, refine the remedial action objectives that have been identified by EPA for the contaminated medium. The revised remedial action objectives will be documented in a technical memorandum and subject to EPA approval. Respondent will then identify a preliminary range of broadly defined potential

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remedial action alternatives and associated technologies. The range of potential alternatives should encompass where appropriate, alternatives in which treatment significantly reduces the toxicity, mobility, or volume of the waste; alternatives that involve containment with little or no treatment; and a no-action alternative.

- Document the need for treatability studies

If remedial actions involving treatment have been identified by Respondent or EPA, treatability studies will be required except where the Respondent can demonstrate to EPA's satisfaction that they are not needed. Where treatability studies are needed, initial treatability testing activities (such as research and study design) will be planned to occur concurrently with Site characterization activities.

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- Begin preliminary identification of potential ARARs

Respondent will conduct a preliminary identification of potential state and federal ARARs (chemical-specific, location specific and action specific) to assist in the refinement of remedial action objectives, and the initial identification of remedial alternatives and ARARs associated with a particular action. ARAR identification will continue as Site conditions, contaminants, and remedial action alternatives are better defined.

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3.4 Scoping Deliverables

Respondent will develop a Workplan documenting the decision and evaluations completed during the scoping process. It should be developed in conjunction with the SAP and the HSF. The Workplan will include a comprehensive description of the Work to be performed, including methodologies to be utilized as well as a corresponding schedule.

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3.4.1 RI/FS Workplan

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A Workplan documenting the decisions and evaluations completed during the scoping process will be submitted to EPA for review and approval. The Workplan should be developed in conjunction with the sampling and analysis plan and the Site health and safety plan, although each plan may be delivered under separate cover. The Workplan will include a comprehensive description of the Work to be performed, including the methodologies to be utilized, as well as a corresponding schedule for completion. The Workplan will present a statement of the problem(s) and potential problem(s) posed by the Site and the objectives of the RI/FS. The plan will also include a Site background summary setting forth the Site description including the geographic location of the Site, and to the extent possible, a description of the Site's physiography, hydrology,

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geology, demographics, ecological, cultural and natural resource features; a synopsis of the Site history and a description of previous responses that have been conducted at the Site by local, state, federal, or private parties; a summary of existing data in terms of physical and chemical characteristics of the contaminants identified, and their distribution among the environmental media at the Site. In addition, the plan will include a description of the Site management strategy developed by EPA during scoping, a preliminary identification of remedial alternatives, and data needs for evaluation of remedial alternatives. The plan will reflect coordination with treatability study requirements. It will include a process for and manner of indentifying Federal and state ARARs (chemical specific, location-specific, and action specific).

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The major part of the Workplan is a detailed description of the tasks to be performed, information needed for each task and the Human Health and Ecological Risk Assessment, information needed for each task, and a description of the Work products that will be submitted to EPA. This includes the deliverables set forth in the remainder of this Statement of Work; a schedule for each of the required activities which is consistent with the RI/FS guidance; and a project management plan, including a data management plan (e.g., requirements, data format and backup data management), monthly reports to EPA and meetings and presentations to EPA at the conclusion of each major phase of the RI/FS. Respondent will refer to Appendix B of the RI/FS Guidance for a comprehensive description of the contents of the required Workplan.

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3.4.2 Sampling and Analysis Plan

Respondent will prepare a sampling and analysis plan (SAP) to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data meet DQOs. The SAP consists of a field sampling plan (FSP) and a quality assurance project plan (QAPP).

The FSP will define in detail the sampling and data gathering methods that will be used on the project. It will include sampling objectives, sample location and frequency, sampling equipment and procedures, and sample handling and analysis. The QAPP will describe the projects objectives and organization, functional activities, and quality assurance and quality control (QA/QC) protocols that will be used to achieve the desired DQOs. The DQOs at a minimum shall reflect use of analytic methods to identify contamination and remediation of contamination consistent with the levels for remedial action objectives identified in the proposed National Contingency Plan, pages 51425-26 and 51433 (December 21, 1988). In addition, the QAPP will address sampling procedures, sample custody, analytical procedures and data reduction, validation, reporting and

personnel qualifications. Respondent will demonstrate, in advance to EPA's satisfaction, that each laboratory it may use is qualified to conduct the proposed Work. The laboratory must have and follow an approved QA program. If a laboratory not in the Contract Laboratory Program (CLP) is selected, methods consistent with CLP methods that would be used at this Site for the purposes proposed and QA/QC procedures approved by EPA will be used. If the laboratory is not in the CLP program, a laboratory QA program must be submitted for EPA review and approval. EPA may require that Respondent submit detailed information to demonstrate that the laboratory is qualified to conduct the Work, including information on personnel qualifications, equipment and material specifications. Respondent will provide assurances that EPA has access to laboratory personnel, equipment and records for sample collection, transportation and analysis.

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Because of the unknowns regarding this Site and due to the iterative nature of the RI/FS, additional data requirements and analyses may be identified throughout the process. Respondent will submit a technical memorandum documenting the need for additional data, and identifying DQOs whenever such requirements are identified. Respondent is responsible for fulfilling additional data and analysis needs identified by EPA consistent with the general scope and objectives of this RI/FS.

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3.4.3 Site Health and Safety Plan

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A health and safety plan will be prepared in conformance with Respondent's health and safety program, and in compliance with OSHA regulations and protocols. The health and safety plan will include the 11 elements described in the RI/FS Guidance. It should be noted that EPA does not "approve" the Respondent's health and safety plan, but rather EPA reviews it to ensure that all necessary elements are included, and that the plan provides for protection of human health and the environment.

4. COMMUNITY RELATIONS

EPA will develop and implement community relations activities for the Site. Respondent shall, as requested by EPA, assist EPA by providing information regarding the Site and/or the Site history, participating in public meetings, developing graphics, placing newspaper ads developed by EPA, or distributing fact sheets developed by EPA. In addition, Respondent may establish a community information repository, at or near the Site, to house one copy of the administrative record. All Respondent conducted community relations activities will be subject to oversight by EPA.

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5. SITE CHARACTERIZATION

The overall objective of Site characterization is to describe the nature and extent of contamination within the Site and to describe areas of the Site that may pose a threat to human health or the environment. As part of the RI, Respondent will perform the activities described in this task, including the preparation of a Site characterization summary and a RI report. The overall objective of Site characterization is to describe areas of a Site that may pose a threat to human health or the environment. This is accomplished by first determining a Site's physiography, geology, and hydrology. Surface and subsurface pathways of migration will be defined. Respondent will identify the sources of contamination and define the nature, extent, and volume of sources of contaminations, including their physical and chemical constituents as well as their concentrations at incremental locations to background in the affected media. Respondent will also investigate the extent of migration of this contamination as well as its volume and any changes in its physical or chemical characteristics, to provide for a comprehensive understanding of the nature and extent of contamination at the Site. Using this information, contaminant fate and transport is then determined and projects extent. Respondent shall perform the activities described in this section including:

- Implementation of the Workplan, sampling and analysis plan, and health and safety plan;
- Document field activities;
- Arrange for the laboratory analysis of samples at laboratories specified by EPA and in accordance with the EPA-approved SAPs;
- Deliver laboratory data to EPA in the format specified in the SAPs for inclusion in project database maintained by EPA;
- Prepare summary reports for each phase of investigation; and
- Prepare a draft and final RI report.

Respondent shall notify EPA at least two weeks in advance of field Work starting and shall provide a monthly progress report and participate in meetings at EPA's request. Respondent shall notify EPA in writing upon completion of field activities for the RI. Respondent shall submit all sampling results in a computerized format in order to allow EPA to rapidly evaluate the collected data.

In order to develop a list of potential remedial alternatives, Respondent must know the chemicals of concern and the media of concern that are to be treated (or contained where appropriate). As soon as EPA has evaluated the Site characterization data submitted by Respondent, Respondent shall develop and EPA will approve and release two or more memoranda to all interested parties. One shall list the chemicals of concern for human health and ecological effects and their toxicity values; the other shall list the potential exposure scenarios, exposure assumptions, and exposure point concentrations that EPA plans to use in the Human Health and Ecological Risk Assessment. The purpose of releasing this information is three-fold: 1) to keep the public informed about progress at the Site, 2) to allow public input at this stage, and 3) to give the PRP sufficient information to continue developing remedial alternatives that are appropriate for the Site.

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5.1 Field Investigation

The field investigation includes the gathering of data to define Site physical and biological characteristics, sources of contamination, and the nature and extent of contamination at the Site. These activities will be performed by Respondent in accordance with the Workplan and SAP. At a minimum, this shall include the following:

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5.1.1 Implement and Document Field Support Activities

Respondent shall consistently document and adequately record in well maintained field logs and laboratory reports, information gathered during Site characterization. The method(s) of documentation shall be consistent with that specified in the SAP. Respondent shall use field logs to document observations, measurements, and significant events that occur during field activities. Respondent shall ensure that laboratory reports document sample custody, analytical responsibility, analytical results, adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies.

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Respondent shall maintain field reports and sample shipment records. Analytical results developed under the SAPs shall not be included in any Site characterization summary reports or RI reports unless accompanied by or cross-referenced to a corresponding QA/QC report. In addition, Respondent shall establish a data security system to safeguard field logs, field data sheets, laboratory reports, chain of custody forms and other project records to prevent loss, damage, or alteration of project documentation.

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5.1.2 Investigate and Define Site Physical and Biological Characteristics

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Respondent will collect data on the physical and biological characteristics of the Site and its surrounding area. This information will be ascertained through a combination of physical measurements, observations, and sampling efforts and will be utilized to define potential transport pathways and human and ecological receptor populations. In defining the Site's physical characteristics, Respondent will also obtain sufficient engineering data (such as pumping characteristics) for the projection of contaminant fate and transport, and development and screening of remedial action alternatives, including information to assess treatment alternatives.

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5.1.3 Define Sources of Contamination

Respondent will locate the sources of contamination. For each location, the areal extent and depth of contamination will be determined by

sampling at incremental depths on a sampling grid. The physical characteristics and chemical constituents and their concentrations will be determined for all known and discovered sources of contamination. The Respondent shall conduct sufficient sampling to define the boundaries of the contaminant sources to the level established in the QA/QC plan and DQOs.

Defining the source of contamination will include analyzing the potential for contaminant release (e.g., long term leaching from soil), contaminant mobility and persistence, and characteristics important for evaluating remedial actions, including information to assess treatment technologies.

Respondent shall obtain access to properties for sampling and shall implement the SAP in accordance with the schedule described in the SAP. Respondent shall arrange for analytical data from laboratories to be reported directly to EPA in the format specified by EPA in the SAP.

5.1.4 Describe the Nature and Extent of Contamination

Respondent will gather information to describe the nature and extent of contamination as a final step during the field investigation. Respondent will use analytical techniques sufficient to detect and quantify the concentration of contaminants, the migration of contaminants through various media at the Site. In addition, the Respondent will gather data for calculations of contaminant fate and transport. Respondent will use this information to help to determine aspects of the appropriate remedial action alternatives to be evaluated.

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5.2 Data Analyses

5.2.1 Evaluate Site Characteristics

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Respondent will analyze and evaluate the data to describe:

1) Site physical and potentially biological characteristics
2) contaminant source characteristics
3) nature and extent of contamination
4) contaminant fate and transport

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Results of the Site physical characteristics, source characteristics, and extent of contamination analyses are utilized in the analysis of contaminant fate and transport. The evaluation will include the actual and potential magnitude of releases from the sources and horizontal and vertical spread of contamination, as well as mobility and persistence of contaminants. Where modeling is appropriate, such models shall be identified to EPA in a technical memorandum prior to their use. All data

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and programming, including any proprietary programs, shall be made available to EPA together with a sensitivity analysis. The Respondent shall agree to discuss results and collect any data gaps identified by the EPA. Also this evaluation shall provide any information relevant to Site characteristics necessary for evaluation of the need for remedial action in the Human Health and Ecological Risk Assessment and for the development and evaluation of remedial alternatives. Analyses of the data collected for Site characterization will meet the DQOs developed in the QA/QC plant stated in the SAP (or revised during the RI).

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5.3 Data Management Procedures

Respondent will consistently document the quality and validity of field and laboratory data compiled during the RI.

5.3.1 Document Field Activities

Information gathered during Site characterization will be consistently documented and adequately recorded in well maintained field logs and laboratory reports. The method(s) of documentation must be specified in the Workplan and/or the SAP. Field logs must be utilized to document observations, measurements, and significant events that have occurred during field activities. Laboratory reports must document sample custody, analytical responsibility, analytical results, adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies.

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5.3.2 Maintain Sample Management and Tracking

Respondent will maintain field reports, sample shipment records, analytical results, and QA/QC reports to ensure that only validated analytical data are reported and utilized in the development and evaluation of remedial alternatives. Analytical results developed under the Workplan will not be included in any Site characterization reports unless accompanied by or cross-referenced to a corresponding QA/QC report. In addition, Respondent will establish a data security system to safeguard chain-of-custody forms and other project records to prevent loss, damage, or alteration of project documentation.

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5.4 Site Characterization Deliverables

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Respondent will prepare the preliminary Site characterization summary and the remedial investigation report.

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5.4.1 Preliminary Site Characterization Summary

After completing field sampling and analysis, Respondent will prepare a concise Site characterization summary. This summary will review the investigative activities that have taken place, and describe and display Site data documenting the location and characteristics of surface and subsurface features and contamination at the Site including the affected medium, location, types, physical state, concentration of contaminants and quantity. In addition, the location, dimensions, physical condition and varying concentrations of each contaminant throughout each source and the extent of contaminant migration through each of the affected media will be documented. The Site characterization summary will provide EPA with a preliminary reference for evaluating the development and screening of remedial alternatives and refinement and identification of ARARs.

5.4.2 RI Report

Respondent will prepare and submit a draft RI report to EPA for review and approval. The RI report shall summarize results of field activities to characterize the Site, the sources of contamination, the nature and extent of contamination and the fate and transport of contaminants. Respondent shall refer to Table 3-13 in "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA", OSWER Directive 9355.3-01, October 1988 for a suggested RI report format. Following comment by EPA, Respondent will prepare a final RI report which satisfactorily addresses EPA's comments.

6. TREATABILITY STUDIES

Treatability testing will be performed by Respondent and/or USEPA/ERT to assist in the detailed analysis of alternatives. In addition, if applicable, testing results and operating conditions will be used in the detailed design of the selected remedial technology. The following activities will be performed and/or reviewed by Respondent.

6.1 Determination of Candidate Technologies and of the Need for Testing

Respondent will identify in a technical memorandum, subject to EPA review and approval; candidate technologies for a treatability studies program during project planning. The listing of candidate technologies will cover the range of technologies required for alternatives analysis. The specific data requirements for the testing program will be determined and refined during Site characterization and the development and screening of remedial alternatives.

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6.1.1 Literature Review

Respondent will conduct a literature survey to gather information on performance, relative costs, applicability, removal efficiencies, operation and maintenance requirements, and implementability of candidate technologies. If practical candidate technologies have not been sufficiently demonstrated, or cannot be adequately evaluated for the Site on the basis of available information, treatability testing will be conducted. Where it is determined by EPA that treatability testing is required, and unless Respondent can demonstrate to EPA's satisfaction that they are not needed, Respondent will submit a Statement of Work to EPA outlining the steps and data necessary to evaluate and initiate the treatability testing program.

6.1.2 Evaluate Treatability Studies

Once a decision has been made to perform treatability studies, Respondent and EPA will decide on the type of treatability testing to use. Because of the time required to design, fabricate, and install pilot scale equipment as well as perform testing for various operating conditions, the decision to perform pilot testing should be made as early in the process as possible to minimize potential delays of the FS. To assure that a treatability testing program is completed on time, and with accurate results, the Respondent will either submit a separate treatability testing Workplan or an amendment to the original Site Workplan for EPA review and approval.

6.2 Treatability Testing and Deliverables

If Respondent is conducting the treatability testing, the deliverables required in addition to the memorandum identifying candidate technologies (where treatability studies are conducted) include: a Workplan, a sampling and analysis plan, and a final treatability evaluation report. EPA may also require a treatability study health and safety plan, where appropriate.

6.2.1 Treatability Testing Workplan

Respondent will prepare a treatability testing Workplan or amendment to the original Site Workplan for EPA review and approval describing the Site background, remedial technology(ies) to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, and residual waste management. The DQOs for treatability testing should be documented as well.

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6.2.2 Treatability Study SAP and Health and Safety Plan

If the original QAPP, HSP or FSP is not adequate for defining the activities to be performed during the treatability tests, a separate treatability study SAP or amendment to the original Site SAP will be prepared by Respondent for EPA review and approval.

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6.2.3 Treatability Study Evaluation Report

Following completion of any treatability testing, Respondent will analyze and interpret the testing results in a technical report to EPA, which may be part of the RI/FS or a separate deliverable. The report will evaluate the technology's effectiveness, implementability, cost and actual results as compared with predicted results. The report will also evaluate full scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

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7. DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES

The development and screening of remedial alternatives is performed to develop an appropriate range of waste management options that will be evaluated. This range of alternatives should include, as appropriate, options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, but varying in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no-action alternative. At a minimum these options must ensure protection of human health and the environment, Respondent shall perform the following activities, to complete the development and screening of remedial alternatives, concurrent with the RI Site characterization task.

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7.1 Refine and Document Remedial Action Objectives

Based on Respondent's Human Health and Ecological Risk Assessment, Respondent will review and if necessary modify the Site-specific remedial action objectives, specifically the PRGs (Preliminary Remediation Goals), that were established by EPA prior to or during negotiations between EPA and the Respondent. The revised PRGs will be documented in a technical memorandum that will be reviewed and approved by EPA. These modified PRGs will specify the contaminants and media of interest, exposure pathways and receptors, and an acceptable contaminant level or range of levels (at particular locations for each exposure route).

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7.2 Develop General Response Actions

Respondent will develop general response actions for each medium of interest defining containment, treatment, excavation, pumping, or other actions, singly or in combination, to satisfy the remedial action objectives.

7.3 Identify Areas or Volumes of Media

Respondent will identify areas or volumes of media to which general response actions may apply, taking into account requirements for protectiveness as identified in the remedial action objectives. The chemical and physical characterization of the Site will also be taken into account.

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7.4 Identify, Screen, and Document Remedial Technologies

Respondent shall identify and evaluate remedial technology types and process options applicable to each general response action. The term "technology types" refers to general categories of technologies. The term "process options" refers to specific processes within each technology type. Several broad technology types may be identified for each general response action and numerous technology process options may exist within each technology type.

Respondent shall use information from the RI on contaminant types and concentrations and the Site characteristics to screen out technologies and process options that cannot be effectively implemented at the Site. Respondent shall document the results of the initial screening of technology types and process options. Respondent shall refer to Figures 4-4 and 4-5 in the "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA", OSWER Directive 9355.3-01, October 1988 for examples of figures that may be used to summarize the initial screening of technologies and process options and the evaluation of process options. Process options will be evaluated on the basis of effectiveness, implementability, and cost factors to select and retain one or, if necessary, more representative processes for each technology type. The technology types and process options will be summarized for inclusion in a technical memorandum. The reasons for eliminating alternatives must be specified.

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7.5 Assemble and Document Alternatives

Respondent shall assemble selected representative technologies into alternatives that represent a range of treatment and containment combinations that will address the remedial action objectives for the Site. A summary of the assembled alternatives and their related action-specific ARARs will be prepared by Respondent for inclusion in a technical memorandum. The reasons for eliminating alternatives during the preliminary screening process must be specified.

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7.6 Alternative Screening and Selection of Alternatives for Detailed Analysis

Respondent shall perform a screening of each remedial alternative based on effectiveness, implementability, and cost. As appropriate, the screening will preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives will include options that use treatment technologies and permanent solutions to the maximum extent practicable. PRGs for each chemical in each medium will also be modified as necessary to incorporate any new Risk Assessment information presented in the Human Health and Ecological Risk Assessment report. Additionally, action specific ARARs will be updated as the remedial alternatives are refined.

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7.7 Development and Screening of Alternatives Technical Memorandum

Respondent shall prepare a technical memorandum summarizing the Work performed in the development and screening of alternatives and the results of each subtask described in this section including:

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- A description of the general response actions and the areas or volumes of contaminated media to which they apply,
- A description of the remedial technology types and process options applicable to each general response action,
- The results of the initial screening of remedial technology types and process options,
- A description of the remedial alternatives,
- The results of the screening of alternatives based on effectiveness, implementability, and cost,
- A description of the alternatives that remain after screening and the action-specific State and federal ARARs for each alternative.

Respondent shall submit the technical memorandum to EPA and the State for review and EPA approval in accordance with Section X of the Settlement Agreement and in accordance with the schedule contained in Section 11 of this SOW. This deliverable will document the methods, rationale, and results of the alternatives screening process.

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8. DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES

Upon EPA approval of the Development and Screening of Alternatives Technical Memorandum, the Respondent shall perform a detailed analysis of the remaining remedial alternatives. The detailed analysis shall be sufficient to allow EPA to adequately compare the alternatives, select a remedial action for the Site, and demonstrate satisfaction of the CERCLA statutory remedy selection requirements (§121(b)(1)(A) of the CERCLA).

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Respondent shall assess each alternative against the following seven of the nine evaluation criteria contained in the National Contingency Plan (40 CFR Part 300.430(e) (9) (iii)):

1. Overall protection of human health and the environment
2. Compliance with ARARs
3. Long term effectiveness and permanence
4. Reduction of toxicity, mobility, or volume through treatment
5. Short-term effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

(Note: criteria 8 and 9 are considered after the RI/FS report has been released to the general public)

Respondent shall conduct the detailed analysis of alternatives by evaluating each alternative against the nine evaluation criteria above and then performing a comparative analysis between remedial alternatives. That is, each alternative shall be compared against the others using the evaluation criteria as a basis of comparison. For each alternative Respondent should provide: 1) a description of the alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative, and 2) a discussion of the individual criterion assessment. If the Respondent does not have direct input on criteria 8) state (or support agency) acceptance and 9) community acceptance, these will be addressed by EPA.

Identification and selection of the preferred alternative are reserved by EPA. The Respondent will prepare a technical memorandum summarizing the results of the comparative analysis.

9. FEASIBILITY STUDY REPORT

Respondent shall prepare a draft FS report that summarizes the development and screening of remedial alternatives and the detailed analysis of alternatives. Identification and selection of the preferred alternative are reserved by EPA in consultation with the State. Respondent shall refer to the "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (OSWER Directive 9355.3-01, October 1988) for an outline of the FS report and the required report content. Respondent shall submit the draft FS report to EPA and the State for review and EPA approval in accordance with Section X of the AOC and the schedule contained in Section 11 of this SOW. Respondent will prepare a final FS Report which satisfactorily addresses EPA's comments.

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10. ALTERNATIVES ANALYSIS FOR INSTITUTIONAL CONTROLS AND SCREENING

Respondent shall submit a memorandum on the Institutional Controls identified in the Memorandum on Development and Screening of Alternatives as potential remedial actions. The Alternatives Analysis for Institutional Controls and Screening shall (1) state the objectives (i.e., what will be accomplished) for the Institutional Controls; (2) determine the specific types of Institutional Controls that can be used to meet the remedial action objectives; (3) investigate when the Institutional Controls need to be implemented and/or secured and how long they must be in place; (4) research, discuss and document any agreement with the proper entities (e.g., state, local government entities, local landowners, conservation organizations, Respondents) on exactly who will be responsible for securing, maintaining and enforcing the Institutional Controls. See "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups," (EPA 540-F-00-005), OSWER Directive 9355.0-74FS-P, September 2000. The Alternatives Analysis for Institutional Controls and Screening shall also evaluate the Institutional Controls identified in the Memorandum on Development and Screening of Alternatives against the nine evaluation criteria outlined in the NCP (40 C.F.R. 300.430(e)(9)(iii)) for CERCLA cleanups, including but not limited to costs to implement, monitor and/or enforce the Institutional Controls. See "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups," (EPA 540-F-00-005), OSWER Directive 9355.0-74FS-P, September 2000 for discussion of what factors to consider with respect to evaluation of Institutional Controls under the nine criteria. In addition, it is not necessary to evaluate "reduction of toxicity, mobility or volume through treatment" in the context of Institutional Controls. The Alternatives Analysis for Institutional Controls and Screening shall be submitted as an appendix to the Draft Feasibility Study Report.

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11. SCHEDULE OF DELIVERABLES

Respondent shall deliver documents and perform activities described in this SOW in accordance with the following schedule:

SOW REFERENCE	DOCUMENT OR ACTIVITY	DELIVERY DATE
Section 3.1	Provide existing information	Within 30 days after the Effective Date of the Settlement Agreement and, thereafter, 2 weeks after becoming aware of new information
Section 3.2	Notification of field visit	2 weeks prior to field visit
Section 3.2	Conduct field visit	Within 45 days after the Effective Date of the Settlement Agreement
Section 3.4	Draft RI/FS Workplan, SAP, HSP	Within 30 days prior to

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Section 3.4	Final RI/FS Workplan, SAP, HSP	Within 45 days after receiving EPA and State comments on the Draft Workplan, SAP, HSP
Section 4	Community relations support	As requested by EPA
Section 5	Draft Human Health and Ecological Risk Assessment	As requested by EPA
Section 5	Final Human Health and Ecological Risk Assessment	Within 45 days after receiving EPA and State comments on draft Risk Assessments
Section 5.4.2	Draft RI Report	Within 30 days after EPA's approval of the Risk Assessments
Section 5.4.2	Final RI Report submission	Within 45 days after receiving EPA and State comments on draft RI Report
Section 6	Treatability Studies	See Settlement Agreement, Section IX, 34(g)(1-6)
Section 7	Memorandum on Remedial Action Objectives	See Section IX, 34(h)(1). Within 30 days after submission of the final Treatability study required or, if not required, within 60 days or the Final RI Report submission
Section 7	Draft Development and Screening of Alternatives Technical Memorandum	See Section IX, 34(h)(2). Within 30 days of submission of the Memorandum on Remedial Action Objectives
Section 7	Final Development and Screening of Alternatives Technical Memorandum	Within 45 days after receiving EPA and State comments on Draft Development and Screening of Alternatives Technical Memorandum
Section 7	Report on Comparative Analysis and Presentation to EPA	See Section IX, 34(i)(1). Report on Comparative Analysis submitted within 60 days after receiving final

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		remedial action objectives from EPA. Presentation to EPA within 45 days of submitting the Report on Comparative Analysis.
Section 9 and 10	Draft FS Report [includes Alternatives Analysis for Institutional Controls and Screening, See Section IX, 34(i)(2)]	Within 30 days after the presentation, described in Section IX, 34(i)(1), to EPA
Section 10	Final FS Report submission	Within 30 days after receiving EPA and State comments on draft FS report

ATTACHMENT A
List of Guidance Documents

Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA. OSWER Directive 9355.3-01

A Guide to Developing and Documenting Cost Estimates during the Feasibility Study. EPA 540-R-D0-002, OSWER No. 9355.0-75

CERCLA Compliance with Other Laws Manual. Part I. Interim Final
EPA 540/G - 89/006, OSWER No. 9234.1-01

CERCLA Compliance with Other Laws Manual: CERCLA Compliance with the CWA and SDWA. OSWER No. 9234.2-06/FS